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west virginia department of environmental protection

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## ENGINEERING EVALUATION / FACT SHEET

### BACKGROUND INFORMATION

Application No.: R13-2545H  
Plant ID No.: 099-00089  
Applicant: Allevard Sogefi USA, Inc.  
Facility Name: Prichard Facility  
Location: Prichard, Wayne County  
NAICS Code: 336390  
Application Type: Modification  
Received Date: February 16, 2017  
Engineer Assigned: Mike Egnor  
Fee Amount: \$1,000.00  
Date Received: February 16, 2017  
Complete Date: March 31, 2017  
Due Date: June 29, 2017  
Applicant Ad Date: February 9, 2017  
Newspaper: *The Herald-Dispatch*  
UTM's: Easting: 359.37 km Northing: 4,233.24 km Zone: 17  
Description: The addition of a fourth (electric) automobile filter element production line, 19 injection molding units, increase in hours of operation, and a recalculation of emissions due to more accurate data (which includes the identification of existing formaldehyde (a HAP and TAP) and phenol (a HAP) emissions).

The change in emissions from this modification include a decrease of 0.06 lbs/hr and an increase of 0.74 TPY of NO<sub>x</sub>, a decrease of 0.43 lbs/hr and 1.74 TPY of SO<sub>2</sub>, an increase of 0.19 lbs/hr and 2.00 TPY of CO, an increase of 0.48 lbs/hr and 1.70 TPY of PM<sub>10</sub>, a reduction of 126.55 lbs/hr and 33.69 TPY of VOC's, an increase of 0.87 lbs/hr and 3.83 TPY of Phenol, and an increase of 0.495 TPY of formaldehyde.

### INTRODUCTION

On February 16, 2017 Allevard Sogefi submitted a Modification for the proposed revisions to the automobile filter element production lines.



On February 20, 2017, Allevard Sogefi submitted an affidavit of publication indicating that the required legal notice was run in the Herald-Dispatch on February 9, 2017, initiating the 30-day public notice period. Allevard Sogefi also submitted the application fee of \$1,000 on February 16, 2017 to meet the requirements associated with the Application for Modification Permit.

## DESCRIPTION OF PROCESS

Allevard Sogefi operates on a 21 acres site in the community of Prichard, Wayne County, about 12 miles south of the city of Huntington, WV.

Initially, the facility produced stabilizer bars for the automotive industry. When this business was not successful, the facility permitted its first filter line in 2008 (R13-2545E). The filter line produces gasoline filters, diesel filters, and fine particulate cabin filters. A second line was added in 2013 (R13-2545F) and a third line was added in 2015 (R13-2545G).

The filters are comprised of a filter element material encompassed by a metal or plastic material configured for a specific automotive application.

The filter element material will be a chemical bonded nonwoven polyester material (this material contains formaldehyde and phenol). The raw materials will be received in large rolls. Each application will require the filter element material to be cut to specific diameter, width and folded with a specific number of pleats. The processing of the material will be performed at designated work stations. Each station will be equipped with a 4 inch diameter vacuum drop [FE1SA through FE1SH and FE3SA and FE3SB] designed to capture any dust particles created during the cutting and folding processes. The vacuum system will deliver the capture particles to an externally mounted dust collector [FE1C}. It should be noted that the primary function of the dust collection system is for personnel hygiene and room cleanliness, and not for the purpose of emissions control.

After the filter element material is prepared, the assembly process will utilize Miltec, an automotive sealer/glue, for securing the components together. Once assembled, the filter is passed through one of the three ovens (FE2SA, FE2SC, or FE3SC) to cure the glue. Each oven is a 1.5 MMBTU/hr natural gas-fired Glue Curing Oven equipped with an exhaust stack [FE2EA, FE2EC, and FE3EA]. Each oven is designed to operate between 248F and 365F.

For quality control purposes, the facility utilizes a non-destructive testing station designed to seal test the gasoline and diesel filter assemblies. The Bubble Tester [FE3S] is utilized by all three glue curing lines. The test involves the submersion of a completed gasoline or diesel filter into a bath of isopropyl alcohol. A quality seal is confirmed when no air bubbles are released from within the alcohol bath, the alcohol will evaporate, leaving the filter usable. Due to the evaporation of isopropyl alcohol from the



filters and bath, the Bubble Tester will require 10 gallons of alcohol to be replenished each day of operation. The Bubble Tester will be vented through a roof stack [FE3E].

For interior comfort heating and cooling, a new roof-mounted air conditioner and gas-fired furnace [FE4SA] will be installed and dedicated to the assembly area. The dedicated area will be designated as a "Clean Room". To maintain this status, the room will be equipped with six (6) air make-up units designed to circulate, filter, and provide fresh air to the dedicated area. The air make-up units are equipped with gas-fired burners [FE4SB through FE4SG] to heat the air during cold weather conditions. In addition, two (2) smaller air conditioning and gas-fired units [FES4H and I] will be installed in connecting hallways.

Filter Line 4 (FL4S) was installed in 2016. This line features an electric oven and filters produced do not utilize adhesive. The same filter paper is utilized in the filters produced on this line. This results in emissions of phenol and formaldehyde which vent through (FL4E). Since the oven on this line is electric no combustion emissions are associated with this line.

In 2012, Allevard Sogefi installed 5 injection molding units. An additional 5 injection molding units were installed in 2015. In 2016 4 additional units were installed. The facility plans to install 3 units in 2017. These units utilize Nylon 6,6, Nylon 6, and PPA which contain fiberglass as raw materials. The material is first melted at a range of 535F to 610F (depending on the raw material) and then injected into the mold. The processing rate will depend on the mold but based on previous production records the units could not exceed 300 lbs/hr based on the resin (Nylon 6,6, Nylon 6, or PPA),

## SITE INSPECTION

The most recent inspection of this facility was performed by Richard Ray on May 27, 2016. The facility was found to not be operating in compliance and a Consent Order (CO-R13-E-2016-28) was entered on November 29, 2016. This Permit modification will complete the requirements of this Consent Order.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The facility is moving from a restriction in operating hours of 4,160 hours per year to 8,760 hours per year. Natural gas usage has been changed from 5.79 MMscf/year to 12.18 MMscf/yr.

Calculation methodologies for criteria pollutants are given below:

CO – AP 42 Natural Gas Combustion Table 1.4-1

NOx - AP 42 Natural Gas Combustion Table 1.4-1

PM - AP 42 Natural Gas Combustion Table 1.4-2

SO2 - AP 42 Natural Gas Combustion Table 1.4-2

VOC - AP 42 Natural Gas Combustion Table 1.4-2



Formaldehyde and Phenol were found to be emitted during the glue curing process. The weight % of Formaldehyde (a TAP and HAP) depends on the filter media paper used. It can range between 0.01% and 0.08%. The weight % of Phenol (a HAP) also depends on the filter media paper used. It can range between 0.075% and 0.19%.

Natural gas usage for each of the three Glue Curing Ovens have been changed from 5.79 to 12.18 MMscf/yr.

VOC emissions from the three Glue Curing Ovens used MSDS information and assumed that 100% of the VOC's in the product were emitted to the atmosphere during the curing operation. The Permittee had a ASTM D6150-16 Standard Test Method for Estimating Processing Losses of Plastisols and Organosols Due to Volatility performed. This test was performed by Miltec. The test was done in triplicate and the results showed that only 0.30 % of VOC's were lost during the curing process. The facility used a conservative factor of 3, and are claiming that 0.90 % of VOC's are lost during the curing process.

The Bubble Tester usage of isopropyl alcohol bath has been increased from 1 gallon to 10 gallons per day. Assuming the density of Isopropyl Alcohol is 6.58 lbs/gallon, emissions are:

10 gallons/day \* 6.58 lbs/gallon \* 1 day/24 hours = 2.74 lbs/hr.

2.74 lbs/hr \* 8,760 hrs/yr \* 1 ton/2,000 lbs = 12.0 TPY

The 19 injection molding units use an emission factor from "Development of Emission Factors for Polyamide Processing, Journal of the Air & Waste Management Association, December 27, 2011".

The fourth line, which is electric only, will have only formaldehyde and phenol emissions from the glue curing process. The addition of these are the total VOC's.

## Emissions Summary

The proposed changes addressed in permit application R13-2545H shall result in the affected emission points undergoing emissions as shown in the following Table 1 - Emissions Summary.

Table 1 – Emissions Summary

Pollutant	R13-2545G		R13-2545H		Difference	
	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
NOx	0.82	2.60	0.76	3.34	- 0.06	0.74
SO2	0.44	1.76	0.01	0.02	- 0.43	- 1.74
CO	0.46	0.88	0.65	2.88	0.19	2.00
PM10	0.19	1.20	0.67	2.90	0.48	1.70
VOC	132.28	58.79	5.73	25.10	- 126.55	- 33.69
Phenol	Not Listed	Not Listed	0.87	3.83	0.87	3.83
Fomaldehyde	Not Listed	Not Listed	0.36	0.50	0.36	0.50
Total HAPs	Not Listed	Not Listed	1.23	4.33	1.23	4.33



The changes in emissions are shown below in the revised Table 2 – Condition 4.1.3.

Table 2 – Condition 4.1.3.

Emission Point ID	Description	Pollutant	Emission Limit	
			(lb/hr)	(ton/yr)
FE1E	Exhaust from Dust Collection Baghouse (FE1C)	PM	0.03	0.09
FE2EA	Exhaust from Glue Curing Oven (NG) Line FE1S	NO <sub>x</sub>	<del>0.14</del> <u>0.15</u>	<del>0.30</del> <u>0.66</u>
		SO <sub>2</sub>	<del>0.01</del> <u>&lt; 0.01</u>	<del>0.02</del> <u>&lt; 0.01</u>
		CO	0.12	<del>0.25</del> <u>0.53</u>
		PM <sub>10</sub>	<del>0.02</del> <u>0.01</u>	<del>0.5</del> <u>0.04</u>
		VOC <sup>1</sup>	<del>44.06</del> <u>0.89</u>	<del>19.58</del> <u>3.83</u>
		Formaldehyde <sup>2</sup>	<u>0.12</u>	<u>0.17</u>
		Phenol	<u>0.28</u>	<u>1.24</u>
FE3E	Bubble Tester	VOC	<del>0.41</del> <u>2.74</u>	<del>0.86</del> <u>12.0</u>
FE2EC	Exhaust from Glue Curing Oven (NG) Line FE2S	NO <sub>x</sub>	<del>0.14</del> <u>0.15</u>	<del>0.30</del> <u>0.66</u>
		SO <sub>2</sub>	<del>0.01</del> <u>&lt; 0.01</u>	<del>0.02</del> <u>&lt; 0.01</u>
		CO	0.12	<del>0.25</del> <u>0.53</u>



Emission Point ID	Description	Pollutant	Emission Limit	
			(lb/hr)	(ton/yr)
		PM <sub>10</sub>	<del>0.02</del> <u>0.01</u>	<del>0.5</del> <u>0.04</u>
		VOC	<del>44.06</del> <u>0.89</u>	<del>19.58</del> <u>3.83</u>
		Formaldehyde <sup>2</sup>	<u>0.12</u>	<u>0.163</u>
		Phenol	<u>0.28</u>	<u>1.23</u>
FE3EA	Exhaust from Glue Curing Oven (NG) Line FE3S	NO <sub>x</sub>	<del>0.14</del> <u>0.15</u>	<del>0.30</del> <u>0.66</u>
		SO <sub>2</sub>	<del>0.01</del> <u>&lt; 0.01</u>	<del>0.02</del> <u>&lt; 0.01</u>
		CO	0.12	<del>0.25</del> <u>0.53</u>
		PM <sub>10</sub>	<del>0.02</del> <u>0.01</u>	<del>0.5</del> <u>0.04</u>
		VOC	<del>44.06</del> <u>0.89</u>	<del>19.58</del> <u>3.83</u>
		Formaldehyde <sup>2</sup>	<u>0.12</u>	<u>0.17</u>
		Phenol	<u>0.28</u>	<u>1.24</u>
<u>FL4-E</u>	<u>Filter Line 4 (Electric)</u>	<u>VOC</u>	<u>0.04</u>	<u>0.14</u>
		<u>Formaldehyde<sup>2</sup></u>	<u>&lt; 0.01</u>	<u>&lt; 0.01</u>
		<u>Phenol</u>	<u>0.03</u>	<u>0.13</u>
FE4EA	15 ton Rooftop Gas Furnace	NO <sub>x</sub>	<del>0.4</del> <u>0.31</u>	<del>1.62</del> <u>1.36</u>
FE4EB	Makeup Air Handler #1			
FE4EC	Makeup Air Handler #2			
FE4ED	Makeup Air Handler #3			
FE4EE	Makeup Air Handler #4	SO <sub>2</sub>	<del>0.1</del> <u>&lt; 0.01</u>	<del>0.01</del> <u>&lt; 0.01</u>



Emission Point ID	Description	Pollutant	Emission Limit	
			(lb/hr)	(ton/yr)
FE4EF	Makeup Air Handler #5	CO	<del>0.4</del>	<del>1.69</del>
FE4EG	Makeup Air Handler #6		<u>0.26</u>	<u>1.14</u>
FE4EH	Split System A/C #1	PM <sub>10</sub>	<del>0.1</del>	<del>0.05</del>
FE4EI	Split System A/C#2		<u>0.02</u>	<u>0.09</u>
		VOC	<del>0.1</del>	<del>0.05</del>
<u>IM-1E – IM-19E</u>	<u>Injection Molding Units #1 - #19</u>	<u>PM</u>	<u>0.59</u>	<u>2.60</u>
		<u>VOC</u>	<u>0.29</u>	<u>1.25</u>
		<u>CO</u>	<u>0.03</u>	<u>0.15</u>
		<u>NO<sub>x</sub></u>	<u>&lt; 0.01</u>	<u>&lt; 0.01</u>
		<u>Total HAPs<sup>3</sup></u>	<u>&lt; 0.01</u>	<u>&lt; 0.01</u>

1 – VOC emissions include emissions of phenol and formaldehyde.

2 – Formaldehyde emissions will be limited to 990 pounds on a 12 month rolling total to remain under the 45CSR27 1,000 pound limit for BAT analysis.

3 – Hazardous air pollutants identified in the study were hydrogen cyanide, maleic anhydride, and styrene.

## REGULATORY APPLICABILITY

The following State and Federal regulations were considered for applicability to the subject facility:

The following regulations apply to this production unit: West Virginia Regulation 2 and US EPA Standards of performance for new stationary sources.

### RULE 2 - CONTROL OF PARTICULATE MATTER FROM COMBUSTION OF FUEL IN INDIRECT HEAT EXCHANGES

The Boiler (75S) once had the ability to burn natural gas and #2 fuel oil. Condition 4.1.5 limited the emission of smoke and/or particulate matter greater than 10% opacity. It also required visible emission requirements using Method 9. As the ability to burn #2 fuel oil has been removed, the boiler can only use natural gas as a fuel source. Natural gas is a clean burning fuel, therefore compliance with the opacity limit will be shown by the natural gas recordkeeping requirement given in Condition 4.3.6. The Method 9



requirement in Condition 4.1.5 has been removed. Conditions 4.2.2, 4.3.10, and 4.4.3 have been changed to “Reserved”. Appendix B has been removed.

## RULE 27 – TO PREVENT AND CONTROL THE EMISSIONS OF TOXIC AIR POLLUTANTS

The facility has discovered that there are formaldehyde emissions from the glue curing ovens. The facility would be subject to 45CSR27 if there were emissions of 1,000 pounds per year or higher. In order to remain below the limit, Condition 4.1.3 provides formaldehyde limits of less than 1,000 pounds per year for all four ovens. As there are multiple types of filters that have different percentages of formaldehyde that range from 0.01% to 0.08%, Condition 4.1.5 has been revised to set limits on the amount of paper that can be used in ranges of formaldehyde percentage. This is given below in Table 3 – Formaldehyde limit in Condition 4.1.5:

Table 3 – Formaldehyde limit in Condition 4.1.5.

<b>Formaldehyde content used in calculation</b>	<b>Formaldehyde Range</b>	<b>Proposed Paper Limit (lbs)</b>	<b>Formaldehyde (lbs/yr)</b>
0.01%	0.00% to 0.01%	1,100,000	110
0.04%	>0.01% to 0.04%	85,000	34
0.06%	>0.04% to 0.06%	75,000	45
0.08%	>0.06% to 0.08%	1,000,000	800
total paper		2,260,000	989

Condition 4.1.9 limits the facility to 990 pounds per year of formaldehyde on a 12-month rolling average.

## 40CFR60 SUBPART Dc – STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

Boiler (75S) was previously rated at 400 hp, 16.4 MMBTU/hr and was subject to this Subpart. It has been modified to burn only natural gas, and the boiler capacity has been reduced to 239 hp, 9.757 MMBTU/hr. Therefore, it is no longer subject to this Subpart. The applicable requirements have been removed from this permit. These include 4.1.9, 4.3.7, 4.3.8, 4.3.9, 4.4.2, and 4.5.1.

## 40CFR60 SUBPART ZZZZ – NESHAPS FOR STATIONARY RICE



The facility has an emergency fire 172 hp diesel fuel pump (113S). The facility is an area source of HAPs. The pump was built in 1972 and installed around 1992. The requirements for a <500 hp CI emergency engine include:

40CFR§60.6603(a) and Table 2(d)(4) – This requires maintenance requirements for the engine.

40CFR§60.6604(b) – This requires the engine to use nonroad diesel fuel.

40CFR§60.6625(e), (f), (h), and (i) – These requirements include operating the engine in a manner consistent with good air pollution control practices, installing a non-resettable hour meter, minimizing the engine's time spent at idle during startup and startup time, and the option of utilizing an oil analysis program to extend the oil change requirements.

40CFR§60.6605 – These requirements for the engine include requiring the Backup diesel fire pump to be in compliance with its applicable requirements at all times, and to maintain the engine in a manner consistent with safety and good air pollution control practices.

40CFR§60.6640 – The requirements for the engine include requiring the Backup diesel fire pump to operate and maintain the engine according to manufacturer's operation and maintenance instructions, report each instance where the operating limitation were not met, and provided time limitations and exceptions of usage.

40CFR§60.6655 – The requirements for the engine include requiring recordkeeping for reports submitted, malfunctions, maintenance, continuous compliance, and hours of operation.

40CFR§60.6650(h) – The requirements for the engine include annual reporting requirements. The information required in the reports is specified in the Condition.

#### **RACT**

45CSR21-40.3.c requires RACT analysis on a case by case basis for those VOC emissions greater than 6 pph which are constructed, modified, or begin operation after the date 45CSR 21 becomes effective. The proposed changes to R13-2545H do not include an increase of VOC's greater than 6 pph.

#### **TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS**

This section provides an analysis for those regulated pollutants that may be emitted from the Alleward Sogefi USA, Inc. Prichard Facility and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM10 and PM2.5), and Sulfur Dioxide (SO2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other



pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following HAPs are common to this industry. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
Phenol	VOC	No	Category D – Inadequate Data
Maleic Anhydride	VOC	No	No assessment
Styrene	VOC	No	No assessment
Hydrogen Cyanide	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at [www.epa.gov/iris](http://www.epa.gov/iris).

## MONITORING OF OPERATIONS

The Backup diesel fire pump engine (113S) is required to install a non-resettable hour meter to show fuel usage.

The Boiler (75S) is required to record natural gas fuel usage.

Changes to R13-2545G include:

1. Updated the Permit Number to R13-2545H.



2. Changed the contact information in Condition 3.5.3.
3. Updated the equipment table.
4. The annual MMscf per year has been changed from 5.79 to 12.18 in Condition 4.1.2.
5. Condition 4.1.3 has been revised to increase natural gas usage, revise emissions, add formaldehyde and phenol limits to the Glue Curing Ovens, add a fourth electric curing oven, and add 19 injection molding units.
6. Condition 4.1.5 has been revised to limit the amount of filter paper and formaldehyde percentage of the various filters used for all four glue ovens.
7. Condition 4.4.7 has been revised to require monthly records of each type of filter produced, the amount of filter paper (separated by formaldehyde percentage) produced, and operating temperatures.
8. Condition 4.1.7 has been revised to increase the amount of isopropyl alcohol in the bubble tester from 1 to 10 gallons per day.
9. Condition 4.1.9 has been added to limit the facility to 990 pounds of formaldehyde on a 12-month rolling average.
10. Condition 4.4.8 has been added to require monthly records of the amount and type of materials used in the injection molding units (IM-1S through IM-19S).
11. Condition 4.4.9 has been added to show compliance with Conditions 4.1.5 and 4.1.9. The name of each filter paper, pounds of each filter paper, percentage of formaldehyde emitted, and total formaldehyde emitted during the rolling 12-month period.
12. Condition 4.4.10 has been added to determine the facility wide amount of VOC's emitted at the facility.
13. Condition 4.4.11 has been added to determine the ASTM D6150-11 results for the adhesive to be recorded and maintained on site.
14. Condition 4.3.1 has been added to require the facility to test the percent volatile matter from the glue curing operation once per calendar year in triplicate.



15. Condition 4.5.1 has been added to require that the permit be updated if the percent volatile matter exceeds 0.90%.

#### RECOMMENDATION TO DIRECTOR

Permit application, R13-2545H, submitted by Alleward Sogefi USA, Inc., for the modification of the production facility located at the Prichard Facility in Prichard, Wayne County, WV, has been reviewed and determined to meet all applicable requirements, and is therefore, recommended for approval.

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Mike Egnor  
Engineer

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Date